Whirlwind Intro to UL 4600 Safety Standard for Autonomous Vehicles

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EDGE CASE RESEARCH

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- ■ **Self Driving Car safety case assessment**
- ■ **Underwriters Laboratories**
  - ● **Non-profit Standards Development Organization**
  - ● **Standards Technical Panel:**
    Developers, suppliers, academia, government, insurance, assessors, international reps., …
  - ● **UL 4600 issued April 2020 for light vehicles**
    - – UL 4600 version 2   kickoff summer 2020
    - – UL 4600-2 for trucks   kickoff summer 2020
- ■ **Goal based approach:**
  - ● **Works with other standards to avoid gaps in safety approaches**

EDGE CASE RESEARCH

- **Safety claims**
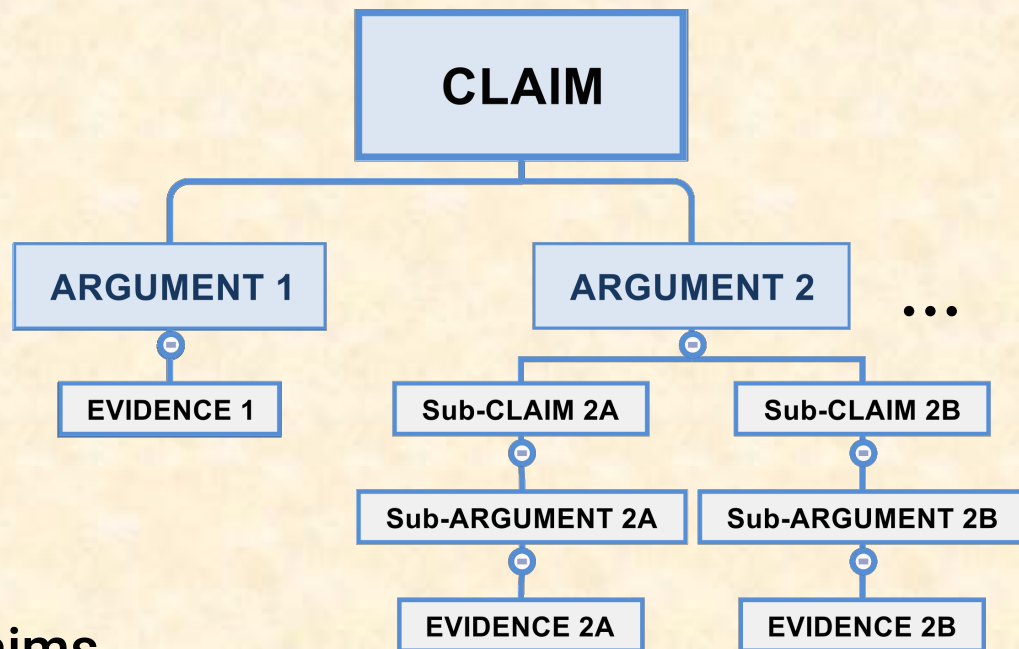 - "What does safe mean?"
- **Arguments**
  - "Why do we think it's safe?"
- **Evidence**
  - "Where's the data?"

- **4600 helps ensure:**
  - Evidence ➔ Arguments ➔ Claims
  - Seeded hazard lists: #DidYouThinkofThat?
  - System level approach to safety

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System Safety

https://bit.ly/2GvDkUN

Is it safe to drive now?

■ Driving:
- Functional safety & SOTIF
- Software safety in general
- Machine learning and autonomy

■ There is no "Captain" in charge:
- Lifecycle: deployment, operation, incidents, maintenance, …
- Infrastructure: vehicle, roads, data networks, cloud computing, …
- Road users: pedestrians, light mobility, emergency responders, …
- Environment: Operational Design Domain (ODD) violations
- … and more …

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■ **Post-deployment feedback is essential**

■ **Safety Performance Indicators (SPIs)**
- Is the system's behavior safe?
- Are assumptions in the safety case true?
- Does field data look like we expect it to?

■ **Feedback loops**
- Diagnose and fix root cause of SPI alerts:
  – Testing, operational, procedural, training data, …
- Field feedback continually improves:
  vehicle design // safety case // risk evaluation

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WE DELIVER THE PROMISE OF AUTONOMY

https://edge-case-research.com/ul4600/